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Raymond J. Cho

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WILSON SONSINI GOODRICH & ROSATI  
650 PAGE MILL ROAD  
PALO ALTO, CA 94304-1050

EXAMINER

LOVEL, KIMBERLY M

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/802,615	<b>Applicant(s)</b> CHO ET AL.	
	<b>Examiner</b> KIMBERLY LOVEL	<b>Art Unit</b> 2167	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 4, 6-26 and 35-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4, 6-26 and 35-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Claims 4, 6-26 and 35-49 are rejected and claims 1-3, 5 and 27-34 are canceled.

### ***Continued Examination Under 37 CFR 1.114***

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 13 April 2009 has been entered.

### ***Claim Objections***

3. Claims 11 and 12 are objected to because of the following informalities:  
  
Claim 11, lines 1-2 contains a duplicate for "the."  
  
In regards to claim 12, it is suggested that an "and" be inserted at the end of line  
  
9.  
  
. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 4, 6, 7, 9, 11, 12-27, 35, 36, 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No 6,263,335 to Paik et al (hereafter Paik) in view of the article “Sentence Analysis by Case-Based Reasoning” to Chakkour et al (hereafter Chakkour) in view of the article “Object Role Modeling (ORM/NIAM) to Halpin (hereafter Halpin).**

Referring to claim 4, Paik discloses a method for constructing a knowledge representation, the method comprising the steps of:

selecting articles [raw documents] to serve as information sources for the knowledge representation [knowledge base], wherein the selected articles are stored on a computer (see column 9, lines 38-60);

extracting information contained in the articles including facts expressed in an article's natural language [concept-relation-concept triple] (see column 9, line 38 – column 10, line 4 and column 10, lines 35-39);

formatting the facts [formatted by a CRC] (see column 9, line 38 – column 10, line 4); and

storing the formatted facts in the knowledge representation [indexed and stored in a KR database 115] (see column 9, lines 38 – column 10, line 4).

Paik fails to explicitly disclose the further limitations of wherein the facts comprise a first and second physical object that are related by a process; formatting the facts as an object and process relationship for storage in the knowledge representation; verifying that the information facts extracted from the selected articles are correct; and verifying that the facts extracted from the selected articles are placed in the correct format for storage in the knowledge representation. Chakkour discloses parsing scientific texts in order to index concepts (see abstract), including the further limitations of:

extracting information contained in articles [scientific texts] including facts expressed in an article's natural language [natural language processing], wherein the facts comprise a first and second physical object that are related by a process (see abstract; Section 2: From Syntactic to Conceptual Analysis; Section 3: The System Using Case-Based Reasoning; and Section 4: Case Retrieval); and

formatting the facts as an object and process relationship for storage in the knowledge representation (see Section 2: From Syntactic to Conceptual Analysis and Section 4: Case Retrieval).

It would have been obvious to one of ordinary skill in the art to select articles in which to extract facts and to store the facts disclosed by Chakkour in the manner applied to the concept-relation-concept triples disclosed by Paik. One would have been motivated to do so in order to form a knowledge base in which information can be

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quickly and efficiently retrieved from in order to provide a user with a response to a query.

The combination of Paik and Chakkour (hereafter Paik/Chakkour) fails to explicitly disclose the further limitations of verifying that the information facts extracted from the selected articles are correct; and verifying that the facts extracted from the selected articles are placed in the correct format for storage in the knowledge representation. Halpin discloses the concept of object-role modeling, which is the storage of concepts as objects and the roles that the objects play (see page 1, Section 1.1: ORM: what is it and why we use it?), including the further limitations of

verifying that the information facts extracted from the selected articles are correct [as a quality check at Step 1, we can ensure that objects are well identified] (see page 6, 2<sup>nd</sup> paragraph); and

verifying that the facts extracted from the selected articles are placed in the correct format for storage in the knowledge representation [as a second quality check at step 1] (see page 6, 3<sup>rd</sup> paragraph).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the quality checking steps disclosed by Halpin in order to verify the facts extracted and stored by Paik/Chakkour. One would have been motivated to do so in order to determine the accuracy of the rules for extraction and thereby increase the ability to provide accurate information to a user.

**Referring to claim 6**, the combination of Paik/Chakkour and Halpin (hereafter Paik/Chakkour/Halpin) discloses the method of claim 48 wherein both the extracting

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step and verifying step are performed by the same person, which person [expert] has been qualified by a predetermined procedure to perform both steps simultaneously (Halpin: page 6, see paragraphs 2-5).

**Referring to claim 7**, Paik/Chakkour/Halpin discloses the method of claim 4 wherein at least the steps of extracting and verifying occur in geographically separated locations (Halpin: page 6, see paragraphs 2-5).

**Referring to claim 9**, Paik/Chakkour/Halpin discloses the method of claim 4, wherein the extracting information step includes using a computer-driven parser of natural language (Chakkour: see Section 3: The System Using Case-Based Reasoning, lines 1-3 and Paik: see column 9, lines 53-60).

**Referring to claim 11**, Paik/Chakkour/Halpin discloses the method of claim 4, wherein the first physical object is an effector of the process and the process is an action that acts upon the second physical one or more second object (Chakkour: see Section 2: From Syntactic to Conceptual Analysis and Halpin: see page 6, 1<sup>st</sup> paragraph – the listed examples).

**Referring to claim 12**, Paik discloses a system for extracting information from articles originating from a first database and storing the extracted information in a second database, the system comprising:

an information extractor [Extractor 105] that extracts a finding from an article's natural language (see column 9, line 38 – column 10, line 4 and column 10, lines 35-39);

formatting the facts [formatted by a CRC] (see column 9, line 38 – column 10, line 4); and

a computer system in communication with the second database for storing the structured finding in the second database [indexed and stored in a KR database 115] (see column 9, lines 38 – column 10, line 4).

Paik fails to explicitly disclose the further limitations of an information extractor that extracts a finding from an article's natural language and translates this finding into a structured finding comprising at least an object, process, and a relationship between the object and process, wherein the information extractor is an application program; and a content reviewer in communication with the information extractor for verifying whether the structured finding has been properly formatted for storage in the second database, wherein the content reviewer is an application program. Chakkour discloses parsing scientific texts in order to index concepts (see abstract), including the further limitation of an information extractor that extracts a finding from an article's natural language and translates this finding into a structured finding comprising at least an object, process, and a relationship between the object and process, wherein the information extractor is an application program (see abstract; Section 2: From Syntactic to Conceptual Analysis; Section 3: The System Using Case-Based Reasoning; and Section 4: Case Retrieval).

It would have been obvious to one of ordinary skill in the art to select articles in which to extract facts and to store the facts disclosed by Chakkour in the manner applied to the concept-relation-concept triples disclosed by Paik. One would have been motivated to do so in order to form a knowledge base in which information can be



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quickly and efficiently retrieved from in order to provide a user with a response to a query.

Paik/Chakkour fails to explicitly disclose the further limitation of a content reviewer in communication with the information extractor for verifying whether the structured finding has been properly formatted for storage in the second database, wherein the content reviewer is an application program. Halpin discloses the concept of object-role modeling, which is the storage of concepts as objects and the roles that the objects play (see page 1, Section 1.1: ORM: what is it and why we use it?), including the further limitation of a content reviewer in communication with the information extractor for verifying whether the structured finding has been properly formatted for storage in the second database, wherein the content reviewer is an application program] (see page 6, 3<sup>rd</sup> paragraph).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the quality checking steps disclosed by Halpin in order to verify the facts extracted and stored by Paik/Chakkour. One would have been motivated to do so in order to determine the accuracy of the rules for extraction and thereby increase the ability to provide accurate information to a user.

**Referring to claim 13**, Paik/Chakkour/Halpin discloses the system of claim 12, further comprising a query management and information display unit for responding to user inquiries for information stored in the second database and for retrieving information from the second database in response to those queries (Paik: see column 4, line 64 – column 5, line 2).

**Referring to claim 14**, Paik/Chakkour/Halpin discloses the system of claim 12, wherein the second database is frame-based (Paik: see column 6, lines 48-54).

**Referring to claim 15**, Paik/Chakkour/Halpin discloses the system of claim 12, wherein the structured finding is formatted according to a fact-based model (Chakkour: see Section 2: From Syntactic to Conceptual Analysis).

**Referring to claim 16**, Paik/Chakkour/Halpin discloses the system of claim 12, wherein the relationship between the object and process takes the form of the process being an action that acts upon the object (Chakkour: see Section 2: From Syntactic to Conceptual Analysis and Halpin: see page 6, 1<sup>st</sup> paragraph – the listed examples).

**Referring to claim 17**, while Paik/Chakkour/Halpin discloses the system of claim 12, wherein the object can come from a gene, protein, cell, or organism (Chakkour: see Section 2: From Syntactic to Conceptual Analysis).

**Referring to claim 18**, Paik/Chakkour/Halpin discloses the system of claim 12, wherein the finding is derived from one or more sentences, a portion of a sentence, a diagram, figure or table (Chakkour: see Section 1: Introduction, lines 9-10 – sentences; and Halpin: see page 5, Table 2 - table).

**Referring to claim 19**, Paik/Chakkour/Halpin discloses the system of claim 12, wherein the second database includes an ontology (Paik: see Table 3 and Chakkour: see Section 3.1: Exploited Knowledge).

**Referring to claim 20**, Paik/Chakkour/Halpin discloses the system of claim 12, wherein the first database [knowledge base] is coupled to, and in communication with the information extractor (Paik: see Fig 1).

**Referring to claim 21**, Paik/Chakkour/Halpin discloses the system of claim 12, further including a server, for selecting articles [raw documents] for information extraction from among a plurality of articles residing in the first database (Paik: see column 9, lines 53-60).

**Referring to claim 22**, Paik/Chakkour/Halpin discloses the system of claim 12, wherein the article's representation of the finding has a first format and wherein the translation of the finding includes a translation of the finding into a natural language having a second format (Paik: see column 9, line 61 – column 10, line 4).

**Referring to claim 23**, Paik/Chakkour/Halpin discloses the system of claim 12, wherein information is extracted using a user template [database template] (see Paik: column 2, lines 51-67).

**Referring to claim 24**, Paik/Chakkour/Halpin discloses the system of claim 12, wherein information is extracted using a computer driven parser of the natural language (Chakkour: see Section 3: The System Using Case-Based Reasoning, lines 1-3 and Paik: see column 9, lines 53-60).

**Referring to claim 25**, Paik/Chakkour/Halpin discloses the system of claim 12, wherein the structured finding comprises a first object, second object and a process relationship (Chakkour: see Section 2: From Syntactic to Conceptual Analysis and Halpin: see page 6, 1<sup>st</sup> paragraph – the listed examples).

**Referring to claim 26**, Paik/Chakkour/Halpin discloses the system of claim 12, wherein the structured finding comprises an object, a process and a process

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relationship (Chakkour: see Section 2: From Syntactic to Conceptual Analysis and Halpin: see page 6, 1<sup>st</sup> paragraph – the listed examples). .

**Referring to claim 35**, Paik/Chakkour/Halpin discloses the system of claim 12, wherein the object is an effector of a plurality of processes and all of these processes are actions that act upon a second object (Chakkour: see Section 2: From Syntactic to Conceptual Analysis and Halpin: see page 6, 1<sup>st</sup> paragraph – the listed examples). .

**Referring to claim 36**, Paik/Chakkour/Halpin discloses the system of claim 12, wherein the article's natural language includes a first and second finding and wherein the first finding comprises the process and object and the object includes the second finding (Chakkour: see Section 2: From Syntactic to Conceptual Analysis and Halpin: see page 6, 1<sup>st</sup> paragraph – the listed examples). .

**Referring to claim 48**, Paik/Chakkour/Halpin discloses the method of claim 4, wherein the extracting information step is performed by knowledge extraction personnel and the verifying step is performed by quality control personnel (Halpin: page 6, see paragraphs 2-5).

**Referring to claim 49**, Paik/Chakkour/Halpin discloses the method of claim 4, wherein the extracted information includes metadata on the facts (Chakkour: see Section 2: From Syntactic to Conceptual Analysis).

**6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No 6,263,335 to Paik et al in view of the article “Sentence Analysis by Case-Based Reasoning” to Chakkour et al in view of the article “Object Role Modeling (ORM/NIAM) to Halpin as applied to claim 7 above and further in view of US PGPub 2002/0165737 to Mahran (hereafter Mahran).**

Referring to claim 49, while Paik/Chakkour/Halpin discloses geographically separate locations, Paik/Chakkour/Halpin fails to disclose the further limitation wherein the locations are chosen based upon the cost of performing the respective steps of extracting and verifying, the lowest cost location for each step being selected. Mahran discloses geographically separate locations are chosen based upon the cost of performing the respective steps of extracting and verifying, the lowest cost location for each step being selected (see [0115]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the calculations disclosed by Mahran with the data of Paik/Chakkour/Halpin. One would have been motivated to do so in order to decrease the cost of operating the system.

**7. Claims 37-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No 6,772,160 to Paik et al (hereafter Paik) in view of the article “Object Role Modeling (ORM/NIAM) to Halpin (hereafter Halpin).**

Referring to claim 37, Paik discloses a system comprising:

a) a server configured to:

1) select an article [raw documents] from a database for extraction (see column 9, lines 38-60);

2) assign an article to an information extractor [CRC extractor 105] for extraction of information from an article [concept-relation-concept triple] (see column 9, line 38 – column 10, line 4 and column 10, lines 35-39); and

3) receive information extracted by information extractor (see column 9, line 38 – column 10, line 4)

b) an information store [KR database 115] for storing the extracted information (see column 9, line 38 – column 10, line 4).

Paik fails to explicitly disclose the further limitations of the information to be structured into at least an object, process and a relationship between the object and process object that are related by a process; 4) assign the article and extracted information to a content reviewer; and 5) receive corrections to extracted information from the content reviewer. Halpin discloses information to be structured into at least an object, process and a relationship between the object and process object that are related by a process [objects that play roles] (see page 1, Section 1.1: ORM: what is it and why we use it?); 4) assign the article and extracted information to a content reviewer [quality check] (page 6, paragraphs 2-5); and 5) receive corrections to extracted information from the content reviewer (page 6, paragraphs 2-5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the quality checking steps disclosed by Halpin in order to verify the CRC triples extracted and stored by Paik. One would have been motivated to do so in

order to determine the accuracy of the rules for extraction and thereby increase the ability to provide accurate information to a user.

**Referring to claim 38**, Paik/Halpin discloses the system of claim 37, further comprising the server configured to: 1) assign the article to an information model structure reviewer; 2) receive changes or updates to information model structure from the information model structure reviewer; and 3) store changes or updates to information model structure in the information store (Halpin: see page 6, paragraphs 2-6).

**Referring to claim 39**, Paik/Halpin discloses the system of claim 37, wherein the information extraction process and content review process are performed at different geographical sites (Halpin: page 6, see paragraphs 2-5).

**Referring to claim 40**, Paik/Halpin discloses the system of claim 37, wherein the server is further configured to receive information about quality control metrics (Halpin: see page 6, paragraphs 2-6).

**Referring to claim 41**, Paik/Halpin discloses the system of claim 40, wherein the server is further configured to store information about quality control metrics in the information store (Halpin: see page 6, paragraphs 2-6).

**Referring to claim 42**, Paik/Halpin discloses the system of claim 37, wherein the server is further configured to comprise a query management and information display unit for responding to user inquiries for information stored in the information store and for retrieving information from the information store in response to those queries (Paik: see column 4, line 64 – column 5, line 2).

**Referring to claim 43**, Paik/Halpin discloses the system of claim 37, wherein the information store is frame-based (Paik: see column 6, lines 48-54).

**Referring to claim 44**, Paik/Halpin discloses the system of claim 37, wherein the structured information is formatted according to a fact-based model (Halpin: see Section 1.1).

**Referring to claim 45**, Paik/Halpin discloses the system of claim 37, wherein the relationship between the object and process takes the form of a process being an action that acts upon the object (Halpin: see page 6, 1<sup>st</sup> paragraph – the listed examples).

**Referring to claim 46**, Paik/Halpin discloses the system of claim 37, wherein the structured information is derived from one or more sentences, a portion of a sentence, a diagram, figure or table (Halpin: see page 5, Table 2 - table).

**Referring to claim 47**, Paik/Halpin discloses the system of claim 37, wherein the information store includes an ontology (Paik: see Table 3).

### ***Response to Arguments***

8. Applicant's arguments with respect to the prior art rejections of the claims have been considered but are moot in view of the new ground(s) of rejection.



***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KIMBERLY LOVEL whose telephone number is (571)272-2750. The examiner can normally be reached on 8:00 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Cottingham can be reached on (571) 272-7079. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John R. Cottingham/  
Supervisory Patent Examiner, Art Unit 2167

/Kimberly Lovel/  
Examiner  
Art Unit 2167

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/KL/

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